REMARKS/ARGUMENTS

This Amendment is filed in response to the final Office Action dated December 14, 2010. In the Office Action, Claims 58-61 and 73 have been rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent 7,248,559 to Ma et al. ("*Ma*"). Claims 63, 64, 69, and 70 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over *Ma* in view of WO 02/078280 to Schaefer et al. ("*Schaefer*"). Claims 71 and 72 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over *Ma* and *Schaefer* in view of WO 93/096622 to Jasper et al. ("*Jasper*"). Claim 74 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over *Ma* in view of U.S. Patent 5,852,850 to Langberg et al. ("*Langberg*"). Claims 62 and 65-68 have been objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form. The listed rejections are addressed below. For the Examiner's reference, Applicant has previously canceled Claims 1-57 and has amended Claims 58 and 65 and canceled Claim 64 in this response. Accordingly, Claims 58-63 and 65-74 remain pending in the current application for the Examiner's consideration.

Examiner Interview

An interview was held between the Examiner and the Applicant's attorney on March 22, 2011 to discuss the current rejection of independent Claim 58 based on *Ma*. Applicant's attorney appreciates the Examiner's time, consideration, and input provided during the interview. Applicant's attorney proposed amending Claim 58 by including the features of dependent Claim 64 in Claim 58 and discussed how the amendment distinguishes Claim 58 over *Ma* and *Schaefer*. The amendment proposed during the interview is reflected in this response.

Claim Rejection under 35 U.S.C. § 102

As mentioned, Claims 58-61, and 73 have been rejected as being anticipated by *Ma*. The rejection of each claim is addressed below.

Independent Claim 58

Although Applicant does not agree with the current rejection of Claim 58, in order to expedite prosecution of the present application, Applicant has amended Claim 58 to further distinguish the claimed invention over the cited references. For instance, Applicant has amended Claim 58 to recite embedding a control data block within a plurality of real data blocks; convoluting real data in each real data block with at least some of the control data in the control data blocks; modulating or transforming the convoluted real data in the real data blocks with one or more sub-carrier signals; and modulating or transforming data in the control data block with every sub-carrier that is used to modulate the real data, *wherein each entry of the control data block has a phase angle that is a function of the phase angles of the corresponding entries of the real data blocks*.

The amendment made to Claim 58 amounts to including the features originally recited in canceled Claim 64. On page 7, the Office Action alleges column 4, lines 10-15 of *Schaefer* disclose such a feature. However, Applicant respectfully disagrees.

Schaefer describes a method for frame and frequency synchronization of an OFDM signal, the purpose of which is to impress a pilot phase profile that is then used at the receiving end for frame and frequency synchronization on pilots which are already contained in the OFDM signal for channel estimation. *See* Abstract. The method is initiated by a rough time synchronization unit connected upline, which searches for the beginning of the guard interval in the OFDM signal. *Id*. Comparison between a stored pilot phase profile and a received subcarrier symbol is performed using a cross-correlation, whose result is then evaluated to determine the frame and frequency synchronization. *Id*

As mentioned, the Office Action has specifically referenced column 4, lines 10-15 of *Schaefer* for disclosing the features of originally filed Claim 64. This particular passage of *Schaefer* states:

> "It must be kept in mind that the phase of the pilot subcarriers depends only on the subcarrier index p (l,k) in Equation 1. If one adds an additional phase rotation $\varphi_{RND}(l,k)$, which is a function of the subcarrier index and the OFDM symbol, Equation 2 results…"

Applicant respectfully submits no mention is made in this passage of *Schafer* of adapting or encoding any of the real data with the control data. In particular, this passage of *Schafer* fails to provide any teaching of convoluting real data in each real data block with at least some of the control data in the control data blocks. Furthermore, this passage of *Schafer* fails to provide any teaching of convoluting real data in each real data block with control data that has a phase angle that is a function of the phase angles of the corresponding entries of the real data blocks. Instead, the phase rotation in *Schaefer* is a function of the subcarrier index and the OFDM symbol and has nothing whatsoever to do with the pilots.

Such an understanding is further confirmed in column 8, lines 14-17, where it is noted that:

> "In a first method step 23 the pilots and the useful symbols to be transmitted are mapped to an OFDM symbol. At the same time, *the unique phase profile is impressed on the pilots* (method step 24). The resulting OFDM symbol is then fed to OFDM modulator 10 and 11 (method step 25), in order to generate an OFDM signal." Emphasis added.

Thus, *Schaefer* fails to provide in any of these passages any teaching of modifying the real data using data from the control or pilot blocks. Instead, the only changes disclosed in *Schaefer* are made to the pilot data.

During the interview held on March 22, the Examiner mentioned that *Schaefer* had been cited because, in general, some kind of phase modulation (e.g., modification) is made to the real data in all digital communication. However, regardless of the Examiner's statement, Applicant respectfully points out *Schaefer* only teaches making modifications to pilot data. There is simply

no teaching in *Schaefer* of any modification of real data blocks using data from control or pilot data blocks and especially there is no teaching in *Schaefer* of any modification of the real data blocks using data from control data blocks that have phase angles that are a function of the phase angles of the corresponding entries of the real data blocks. As mentioned, *Schaefer's* equations for p(l,k) are simply for mapping pilot position with previously agreed phase assignments or phase patterns. Such mathematical matrix assignment of pilot positions and pilot phases cannot be considered as convoluting real data in each real data block with at least some of the control data in the control data blocks, as required by amended Claim 58, and certainly cannot be considered convolution with control data that has a phase angle that is a function of the phase angles of the corresponding entries of the real data blocks.

For at least these reasons, Applicant respectfully submits that *Ma* and *Schaefer* fail to teach or suggest each and every feature recited in amended independent Claim 58. Accordingly, Applicant respectfully requests the Examiner to withdraw the current rejection of Claim 58 under § 102(e).

Dependent Claims 59-61 and 73

Claims 59-61 and 73 depend from independent Claim 58. The patentability of independent Claim 58 has been argued as set forth above and thus Applicant will not take this opportunity to argue the merits of the rejection with regard to these dependent claims. However, Applicant does not concede that these dependent claims are not independently patentable and reserve the right to argue the patentability of the dependent claims at a later date if necessary.

Claim Rejection under 35 U.S.C. § 103

As mentioned, Claims 63, 69, and 70 have been rejected as being unpatentable over *Ma* in view of *Schafer*. Claims 71 and 72 has been rejected as being unpatentable over *Ma* and *Schafer* in view of *Jasper*. Claim 74 has been rejected as being unpatentable over *Ma* in view of *Langberg*. The rejection of each claim is addressed below.

Dependent Claims 63, 69, 70-72, and 74

Claims 63, 64, 69, 70-72, and 74 depend from independent Claim 58. The patentability of independent Claim 58 has been argued as set forth above and thus Applicant will not take this opportunity to argue the merits of the rejection with regard to these dependent claims. However, Applicant does not concede that these dependent claims are not independently patentable and reserve the right to argue the patentability of the dependent claims at a later date if necessary.

Allowable Subject Matter

Claims 62 and 65-68 have been objected to as being dependent upon a rejected base claim. However, these claims have been indicated as allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Based at least on the reasons set forth above with respect to the patentability of Claim 58, Applicant respectfully submits that Claims 62 and 65-68 are allowable in their current form because these claims depend from an allowable base claim. Accordingly, Applicant respectfully requests the Examiner to withdraw the current objection of these claims.

Conclusion

The foregoing is submitted as a full and complete response to the final Office Action dated December 14, 2010. The foregoing amendments and remarks are believed to have placed the present application in condition for allowance, and such action is respectfully requested. The Examiner is encouraged to contact Applicant's undersigned attorney at (404) 881-7640 or e-mail at chris.haggerty@alston.com to resolve any remaining issues in order to expedite examination of the present application.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,

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